The Builder.

Vol. XIII.—No. 661.

ALTHOUGH the war, and influences which happened to be in operation during its continuance, repressed the advancement of *art*, it will not have been assumed that all works were in abeyance.* In spite of high prices, private residences on an extensive scale, as we lately found, were completed; and long before the year 1815, more important works had been successfully accomplished.

What railways are now in relation to the engineering skill of the time, the canals were formerly. The chief works of the kind, those which originated with the Duke of Bridgewater, had been commenced shortly after the year 1756. But we find it stated that up to about the year 1800, application had been made for 165 Acts of Parliament for canals; from which we may infer, that these undertakings were hardly checked during the first years of the war.

After a quarter of a century's familiarity with the railroad system, the country still has reason to congratulate itself upon the commercial advantages of ample means of cheap internal communication. We shall have to mention other works more closely associated with our subject, which were undertaken, though some were not immediately commenced. Individuals realized largely by the Government contracts,—under circumstances, amongst those which we have still to regret are incidental to a state of war,—all possible inference to the contrary from the rhapsody of poet-laureates notwithstanding. And the possessions of the large landed proprietors quadrupled in value.

We have already brought the course of our history to about the year 1809 in England—the date of Covent-garden Theatre—at which period the singular character of our later architecture, as to contemporaneous practice of different imitations and divergent systems, had become fairly established. The importance of an active principle in art was under-estimated, and this in the practice of all the styles. The little tendency in the required direction which we discovered in the case of the Gothic style, defeated itself,—because, being not supported by knowledge of the old models, ignorance of available beautiful forms rather than *design* was that which was striking in the new work. In the practice of the Grecian style, the flight of art was further bound down by the utterly erroneous notion that the system was one limited in scope to the range of the known details,—though these were sufficient to allow of greater variety than was attempted. The reduced scale of expenditure on art, usually contemplated, and the seeming irreconcileability of three-storied façades with porticoes, were further difficulties. Whatever the style—and there were many styles attempted—whether we look at the whole, or at one such feature as a portico, it must be confessed that the result is generally unsatisfactory, whether the object be considered as *art*, or as mere imitation. A few remarks in the *Times* leader of a recent date, are quite apposite to the state in which art was found towards the end of the war period in Europe. The writer is speaking of political matters with which we have no present concern; but we may quote the whole passage to show the suggestiveness which there is often in a train of thought apparently far from *architectural*. The article says:—"The common sense of mankind has agreed that there is something inevitably little and narrow-minded in imitations. No imitator, no follower, *ever thoroughly understood his original*, or was anything else than *a reduced and bad copy;* and the best pupils have invariably found it necessary before long to sacrifice their love and admiration for their master to the higher instincts of independence and self-respect. Why Sir Robert Peel's small band of followers have not done this—why they make such a religion of doing what Peel did, and finding out what Peel would have done,—and why in this hopeless pursuit they put themselves into a bad position with nineteen-twentieths of their fellow-countrymen—which Peel certainly would never have done—we cannot divine. There is something morbid in the whole affair, and it is not to be explained by any common rules of action." Whether the reasoning applies to the case there in question, we say we take no trouble to seek; but we are very sure that it fits exactly on to that of many modern buildings, and the old models.

Eventually, indeed, in the use of the Grecian style, greater variety of detail was ventured upon, as by the Messrs. Inwood: whilst the method of combination of the portico and façade was modified by Wilkins, somewhat on the principle of the Glyptothek at Munich, commenced in 1820. The arrangement referred to (of which we shall have to speak in a subsequent place) is that of a central portico, rising so far above the general level, as to allow the line of roof and returning entablature to pass clear above the roof of the wings: in other words, the general building butts against the sides of a portico building;—the ordinary method reversing that arrangement, so as to give the appearance of a mere *superficies* of portico, stuck on to a building or façade. Even where the portico spans nearly the full extent of the front, in such cases usually at the end of the building, there may be a similar defect.

We have already referred to several omissions in the adaptation of Greek architecture, and we may again allude to the advantages of internal columns, and of recessing the back wall of the portico, as helping greatly, in lieu of the continuous roof. Windows at the back of the portico destroy the effect of breadth, and contrast of shade; and, moreover, at once convey the idea, that for the purposes of the building, the portico has no business there. Thus we may gather a few general principles, calculated to assist us much in the critical examination of the numerous attempts at the adaptation of Greek architecture which were made in London, in several important towns of the north of England, and in Edinburgh, and in Munich and Berlin. There are many old examples of porticoes which have neither internal columns, nor recession of the back wall,—perhaps the larger number may be of this character. But in such cases, whilst the portico has ample area and projection, it is made unmistakeably the whole end of the *building*. Where the width of the portico is less than that, a good design is not impossible; but the case is entirely altered. The old examples often differ from the plans given by Vitruvius; yet it would have been well had the Latin author received a little attention at this juncture,—for all his plans recognise the importance of what we are referring to. His temple *in antis* provides the depth of shade; and every addition by which the plan becomes prostylar, peripteral, pseudo-dipteral, or dipteral, leaves the original requisite for effect intact, or adds one other element of beauty. The points in question had been perceived by Holland; but it cannot be said that in Covent-garden Theatre, and some other works of Sir Robert Smirke, the same importance was attached to them, as by the Germans, Schinkel and Klenze. We shall have to instance, at Berlin, the Wachtgebäude and Museum, and at Munich the work we have already named. The application of the principles varied: still, the German architects would have at least recognised the importance of all that we have contended for. But it is probably an error to refer to the Glyptothek at Munich—as we have somewhere seen it done—as the first modern example of the application of the internal columns, and of some other features of effect. The further remark that such points were *never* considered in Great Britain, after the application of the Greek orders, is unquestionably a mistake. The Hunterian Museum at Glasgow has, if we recollect rightly, the hexastyle prostyle according to the Vitruvian precept,—at least so far as regards the retention of columns at the back, *in antis*. One who was mentioned in our last, Thomas Harrison, of Chester, at all events, was in his works alive to the points in question. His portico to the prison at Chester is hexastyle, with a double row of Grecian Doric columns. In the "Portico News Rooms" at Manchester he adopted the arrangement *in antis*. The order is Ionic, the columns, two in number, being unfluted; but the details are defective,—the echinus of the capital being even uncarved. Harrison deserves notice, as having been a considerable worker in the pseudo-Greek school, whose career seems to have commenced earlier than that of Sir Robert Smirke. Born in the year 1744; he visited Italy when very young; and on his return he built a bridge at Lancaster,—architects formerly, being not excluded from this branch of their calling. His chief works were executed at the beginning of the present century, when he was sixty years of age and upwards; and he adds one more to the number of those of former generations, of architects who lived to a green old age,—a piece of testimony to the value of our pursuit as it was formerly, of late years often rudely reversed. Harrison died at Chester, in the year 1829,—or, in his eighty-fifth year. Besides his works at Manchester and Chester, he was employed at Liverpool; at Shrewsbury, where he built the Hill Column; and at other places. He has also been recognised as the architect of the celebrated Dee Bridge, at Chester,—still, for the span of its single arch, a remarkable work; but, some of the chief contrivances in the structure have been ascribed to others. What he attempted in Gothic, is not better than the average of the day: St. Nicholas Church, Liverpool, is, we think, his principal work. In his ordinary style, his taste was highly estimated; of which the best evidence is the fact of his employment by the Earl of Elgin, on his house, Broome Hall, in Scotland, where the order used was Grecian Doric. The building which we mentioned as contemporary with Covent-garden Theatre—1809—the Manchester Exchange—was Greek, only so far as regards the use of a Doric order. The columns were attached to a semi-circular front, and there was a podium and attic. Perhaps few persons recollect that both three-quarter columns, and pilasters not used as *antæ*, are to be met with in the Erectheion, and that there are examples of the podium and attic, and some other especially Roman and Italian features, in Grecian architecture. With the general principle of the Greek architects, such forms were hardly consistent. The Manchester building was covered by a half dome, coffered, rising from an internal order of reeded Ionic columns. Externally the dome was concealed, thus according with what we shall find the practice of the German architects. The effect gained by contrast of the interior, and expanding vault, with the somewhat low appearance of the building by which the eye had been impressed externally, was not without value, and afforded a good lesson in proportion. Harrison would be an important person in the history of modern architecture, if only from the influence which his example had during many years

* See p. 439, *ante*.

afterwards, in rivetting the Greek style upon the architecture of the north. In parts of Lancashire especially, for some years, hardly any building of pretension, no matter what its purpose or general plan, was thought complete until it had received a porch, or a portico,—generally composed of Grecian Doric columns. The details of the original order were expressed with some fidelity; but the real artistic feeling infused into the work became even less than had been shown by Harrison,—to degenerate being, as often before this we have found, one result of the mistaken method in following a model.

One of the best instances which London affords of the erroneous use of the Greek models, is the building in Great Coram-street, now the Russell Institution, and which, possessing a peculiarly heavy version of the Greek Doric, was originally built for the light and festive purpose of an assembly-room. In referring to the pseudo-Greek architecture, in regard to deficiency of sculpture, we ought fairly to allude to the front of Covent-garden Theatre. On the portico, however, no sculpture was attempted. Covent-garden Theatre must have been an early modern instance of the use of cement for important public buildings; and the miserable condition of much of the surface just now, testifies, in one way, to the *value* of the innovation. The old building had been burnt down on September 20th, 1808, after the performance of the play of *Pizarro*, and it was supposed that ignited wadding from the guns had lodged in some part of the scenery. The first stone of Sir Robert Smirke's building was laid on December 31st, in the same year; and the new theatre was *opened* on September 18th, following. The private boxes, which were more numerous than in the old building, were handsomely fitted up, and had ante-rooms. It got bruited about that the object was to admit of assignations; so that, at length, no respectable lady could appear in these boxes. Probably this explains what was very remarkable in the plan of the main box-lobby, as independent of the saloon, namely, the *vacancy* of the ample space which had been intended for rest and promenading between the acts, and where Mr. Kemble expected that parties would take refreshments.

The theatre of Drury-lane, by Benjamin Wyatt, which one authority said was commenced on the 29th of October, a correspondent in a former number recollects under his supervision from the 21st of the month. In any inquiry into the principles of disposition in theatres, Wyatt's building would deserve particular notice, and his "Observations on the Design," &c. should also be consulted. We certainly think that some arrangement of the auditory in theatres, better calculated for convenience as regards seeing and hearing, if not productive of other advantages, might be carried into practical execution. Wyatt is understood to have followed the model of the theatre at Bordeaux, at the time considered the best theatre in Europe for music. The lesson which had been afforded by the destruction of two theatres within a few months, led to an amount of care in the planning and construction of the new building, which we believe has not been surpassed in any modern edifice, as perhaps it had not even in the works of the Romans. The staircases and landings (which are of stone) the architect was careful to have large enough to contain as many persons as could possibly be collected in the auditory. The opposite staircases, to the boxes — "King's side," and "Prince's side" (so called from the situations of the King's box and the Prince's box)—which ascend in one centre and two side flights alternately—have the centre flight exactly double the width of each of the side flights; and they would contain even more persons than were accommodated in the boxes, the number of persons for the whole of the boxes being 1,286, and that for the two staircases, 1,528. The "two-shilling gallery" in Wyatt's plan would hold 550 persons, whilst the two staircases to it would hold 868 persons. In the upper gallery the space allowed of 350 persons, and the staircase leading to it would hold 480 persons. In this calculation, the usual space for each person seated is taken,—being, of course, more than would be really occupied in a crowded staircase. Similar attention, it was considered, was given to the sizes of the openings; the doorways in the main part of the house being from 5 to 6 feet in width. Some of the means of internal communication, however, were found to be inconvenient, and had to be altered in 1822, when the auditory was remodelled by Mr. Beazley.

Certainly, with reference to the danger from fire in most of the London theatres, with their single, long, and narrow passage of entrance to several parts of the house, a nightly peril is run which will some day lead to a calamity of appalling character,—a result which has actually followed in other cases. At the Glasgow theatre, in 1849, some seventy persons were killed, through a mere panic. The temporary barriers in that case happened to be the chief cause of the loss of life; and we should say that some of these contrivances in the present theatre of Drury-lane would call for attention, if, as we apprehend, their arrangement would negative what merit there may be in the building plan. During the same year 1849, an accident at the Victoria Theatre and other occurrences were duly instanced and commented on in these pages*; and on the occasion of the destruction of the Olympic Theatre, which rivalled in rapidity the fire at Drury-lane, it was urged, that had the accident occurred during the performance, many persons would inevitably have been roasted alive. This terrific fate once befel the greater number of the audience in a theatre at Quebec. There, a struggling mass of human beings were jammed in the narrow doorway, and *could not* be drawn out by those outside; whilst the *smell of roasted flesh*, and other sickening details, are described in the account, which we find in the *United Service Magazine*, of some years ago. Are a few such lessons required in London? The great point which Wyatt had in view was, that each person in the house might be able to *feel* that sufficient means of escape were in existence. Thus the chief occasion of disaster—panic, might be prevented. Without attributing anything to such a cause—with present methods of construction—experience has shown that the progress of fire might be enough to leave little chance of escape. Even at Drury-lane—at least as the theatre exists at present—as regards area of openings, attention is called for, especially in the case of the pit. One of the original pit entrances seems to have been lately disused,—if have not others. The staircase and hall space of the boxes may be a trifle larger than might be allowed in cases where ground is valuable; but it is clear that apertures for egress should be always abundantly provided. What we notice in the case of Drury-lane, shows that the lesson of the fire there is being gradually forgotten. All these matters should be placed under proper supervision.

Besides the structural provisions at Drury-lane against chances of fire, several tanks for water were placed on the roof, and pipes were conveyed into every part of the house; whilst in a cellar beyond the outer wall of the stage, was an engine on Bramah's principle, of sufficient power to throw water 10 feet above the roof of the building. In addition to this, an elaborate series of contrivances was placed, at great expense, under the direction of the celebrated inventor of Congreve rockets, by which it was supposed that the whole building could be at any time deluged with water. In the centre of the ceiling over the pit, was a pipe furnished with a contrivance for rotary motion at the end, on the principle of the Catherine-wheel, so as to throw water over the whole auditory. It was afterwards doubted whether the air-reservoir—to be filled by a condensing-pump—which was to set these contrivances in operation—had been made sufficiently air-tight. As experiment could not be resorted to in such a matter, it remained a moot point; and, fortunately, there has been no occasion for either the saving or the destroying agency of water. The writer in Britton and Pugin's "London," doubts whether the contrivances remained when he wrote.

The omission of the portico contemplated in the first design, we find commented upon in a number of the *Examiner* of the time, where the fault is laid to the "instructions of employers." Soane's reputation has no cause to thank our correspondent, for fixing it with the credit of the "miserable abortion" in Brydges-street. The steps here should be looked to; and perhaps require altered plan: we have often seen accidents. The amount of contract as given by Mr. Hodson, exceeds what is stated by the writer before referred to. The cost of Mr. Beazley's alterations and additions, was about 21,000*l.* The colonnade in Russell-street has little merit of any kind. The want of some protection had been loudly expressed. It is strange that all our theatres are still so inadequately provided with what might be made the means of expressing some novelty and beauty. The architecture of Drury-lane Theatre, as seen in the interior, was classical Italian in character, and the Rotonda, obviously designed with a recollection of the Pantheon, is not undeserving of praise. Much improvement might be effected here, and in the staircases, with attention to colour. The large outer hall is excessively mean; and just now, it is so dirty as to produce an impression of that kind which is not always *reasoned* upon by the public, but which we beg to say deserves the attention of any theatrical proprietary. The architect prided himself on the construction of the staircases,—as with reference to the abutment afforded by the circular landing of the Rotonda.

Benjamin Wyatt was the son of James Wyatt. Belonging to the same inexhaustible family was Samuel Wyatt, a builder in extensive practice, who built the Trinity House; Heaton Hall, near Manchester; Tatton Hall, Cheshire; and other works, of which he is called the architect. This Wyatt and James were brothers. Jeffry Wyatt, afterwards Sir Jeffry Wyatville, born in 1766, was nephew to these. He was educated at the free school at Burton-on-Trent, his birthplace, and up to the age of seventeen was filled with a passion for the sea. He made several attempts to get away, and at last was to have joined Admiral Kempenfeldt in the *Royal George;* but not reaching the vessel in time he escaped the disaster. He then visited London, still bent on the same object; but was taken into the office of his uncle Samuel, for seven years, and afterwards into that of James Wyatt, where he became known to the Prince of Wales. In 1799, he entered into partnership with a builder, Mr. John Armstrong, who had large Government contracts—valuable things in the case of buildings, as well as other kinds of work at that time. He was, however, employed extensively as an architect. His union of the two callings was not regarded with much favour by the profession; indeed, it also interfered for some time with his election to the Royal Academy; and great was the surprise when in 1824 he was summoned to Windsor by George IV.

MEMORIALS OF FATHER THAMES.*

An examination of the adjoining map (fig. 1), copied from an engraving made in 1771, will show better than words can express the march of London. We would, however, at present particularly direct attention to one or two points which more particularly bear on the condition of the Thames, and the question of drainage. G. is Old St. Pancras Church. It is not long since that was surrounded by fields. H. is the New Cattle-market, which will soon be hemmed in with houses. From this point to the Thames is now a dense mass of dwellings, from Paddington to the Tower. The Marylebone-fields, Brompton, and Chelsea, have grown into populous districts. Eastward we have Bethnal-green, Hoxton, Mile-end, Poplar, and all adding to the mass. The Isle of Dogs will in a few years be covered with buildings. Greenwich and Deptford are both growing. Beyond the black portion, shown in the engraving, which marks the extent of the Borough in 1771, we have Newington, Walworth, and other large neighbourhoods; and it is evident that before a quarter of a century has passed, London will not only have taken possession of the Isle of Dogs, but also of the ground now vacant on the west of Bow-creek. We are urged to direct attention to this circumstance in consequence of the present intention being to take the sewerage of the metropolis to the Plaistow Levels, or else to Barking-

* See pp. 373, 387, 419, *ante*.

LONDON AND THE THAMES.

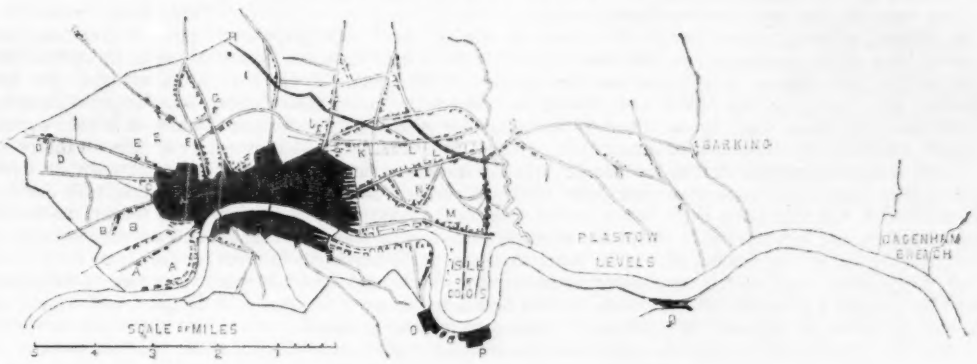

Fig. 1.—*Plan of London in* 1771.

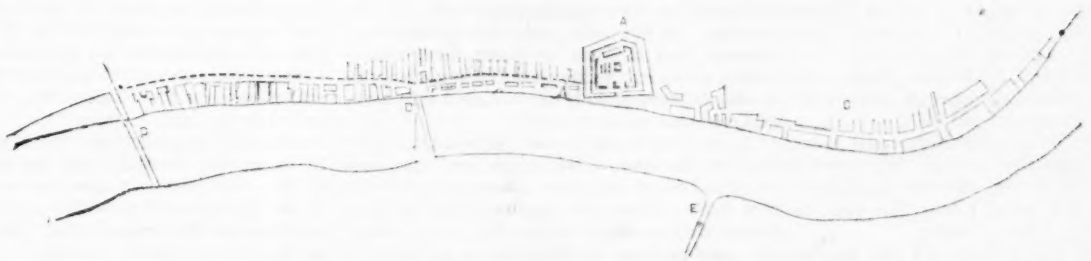

Fig. 2.—*Plan of part of the north margin of the Thames, showing encroachments.*

creek, and then pass it into the Thames. This is done with a view towards purifying the river. It is to be feared, however, that this measure will not have the desired effect, particularly when we consider that the tide runs strongly in for *seven hours*, and *returns but five*.

When we remember the statement of Liebig, that "Thousands of hundred-weights of phosphate flow annually into the sea with the Thames and other British rivers," and that "thousands of hundred-weights of the same material flow annually back again to the land in the form of guano," we must hope, notwithstanding the difficulty of the subject, that the valuable materials from the sewerage will not be much longer wasted.* It therefore becomes a matter for serious consideration if we shall, in this instance, still persist in half measures, and convey our drainage to such a short distance from an immense population. The Dagenham Levels would allow a greater fall, and be attended with less danger. We ought at any rate not to establish a "Laystall" too close to London.

We have already alluded to the circumstance that in the wars, about a century ago, the watermen of the Thames could, in a case of necessity, supply 20,000 able men to the Royal fleet. This was an important arm of the national service; and it may not be without use and interest to gather up a few particulars respecting the regulations of the watermen, and the manner of conveyance on the Thames at that time, when the most rapid stage-coach did not probably exceed in speed the rate of seven miles an hour. Then a voyage up or down the Thames was an event to be well considered beforehand, and also to be held in memory for long after it took place; and so important were some of their voyages considered, that the daring travellers have, on certain occasions, *by the advice of numerous friends*, gone to the expense of printing and paper to place the particulars before the public.

In 1738, one Weddell, as we learn by a published account, accompanied by four or five friends, determined upon a voyage from London to Windsor. A large store of provision, wine, brandy, &c. was laid in, and, after grave discussion, it was determined that they should start from London at seven o'clock in the evening, in order that they might watch the break of day in the pleasant country. Their vessel was a barge partly covered at the stem, in the same manner as those of the Lord Mayor and City companies. After running aground, and experiencing some other alarms, the travellers put into port at Chelsea for refreshment, when some of them are desirous to spend the night ashore: this, however, is overruled. In the neighbourhood of Fulham, they again land about midnight, and an account is given of this hostelry on the Thames' bank, thronged with persons of all descriptions, who are here halting on their journeys of business or pleasure up and down the river. Here the travellers sup, and at the earnest entreaty of the *sailors*, are prevailed upon once more to embark, in order that they may catch the remainder of the tide. The daylight discovers them near Richmond; and, in course of time, and after calling at many ports, they arrive, nothing loath, at Eton, where they rest three days, the vessel in the mean time lying up in the harbour awaiting their pleasure. Weddell employs the greatest portion of this time in writing the book of the voyage, and is anxious to proceed again to London by water, but is overruled by a majority of his companions, and they proceed to town by chaise conveyance, preferring the dangers of the heaths and highways rather than trusting to those of Father Thames. Hogarth's voyage to Rochester, too, will be in the recollection of our readers.

Thames-street, a hundred years ago, was a place of very considerable trade, on account of its convenient situation near the river, the custom-house, &c. The quays, wharfs, and docks which were assigned by Act of Parliament for shipping, lading, and landing of goods, were as follows;—Brewer's-quay, Chester's-quay, Galley-quay, Wool-dock, Custom House-quay, Porter's-quay, Bear's-quay, Sorter's-quay, Wiggun's-quay, Young's-quay, Rafe's-quay, Dix-quay, Smart's-quay. Somer's-quay, Gaunt's-quay, Cock's-quay, Fresh-wharf, and Billingsgate; the latter of which, says Chamberlain, "is not so remarkable for loading and landing of goods and merchandize as it is for being the greatest market for fish in England, and the only port for fish in London. It is a large water-gate or quay, or port for small vessels laden with fish of all sorts, oranges, lemons, Spanish onions, and other commodities." Here, also, at that time, boats and wherries took in their fare for the "*Port of Gravesend*." Each vessel was obliged to depart at the ringing of a bell erected near the stairs for that purpose, which rung a quarter of an hour to give notice of the time of high water at London-bridge, and the time of ebb. On the wharf, the masters of colliers and dealers in coals held a common exchange every day at noon.

The vessels for the conveyance of passengers were something similar to that engaged by Mr. Weddell, and afforded accommodation for both inside and outside passengers, and during high winds and in stormy weather a voyage to Gravesend was not without adventure and inconvenience: sometimes the tide would turn before the journey was completed, and then the passengers were called upon in turn to assist the rowers. We knew an old gentleman, not many years since dead, who has often related, with great glee, that seeing the approaching necessity for this rough work, he has in sufficient time begun to complain to his neighbours of his crippled condition, he having the art of putting his fingers into certain unnatural shapes.* Besides the vessels above referred to, the traveller on the Thames could avail himself of either "oars" or "scullers." Some of the charges were as follows:—

	Oars. s. d.	Scul. s. d.
For crossing the river in every part between Limehouse and Vauxhall ...	0 4	0 2
From the Temple, Dorset-stairs, Blackfriars-stairs, or Paul's-wharf, to Lambeth ...	0 8	0 4
From London-bridge to Limehouse, New Crane, Shadwell-dock, Bell-wharf, and Ratcliffe-cross ...	1 0	0 6

RATES OF OARS UP AND DOWN THE RIVER AS WELL FOR THE WHOLE FARE AS COMPANY.

	Fare. s. d.	Comp. s. d.
To Chelsea, Battersea, and Wandsworth ...	1 6	0 3
„ Kingston ...	5 0	0 9
„ Hampton-court ...	6 0	1 0
„ Chertsey ...	10 0	1 0
„ Windsor ...	14 0	1 0
Down the River.		
From London to Gravesend ...	4 6	0 9
To Blackwall ...	2 0	0 4
„ Greenwich or Deptford ...	1 6	0 3

The hire of a whole tilt-boat for goods to Gravesend was £1 2s. 6d.

It may be also worth while to mention, because the same sort of restriction might be usefully applied to the steam-vessels on the Thames at present, that to prevent the losing of lives of persons passing on the river, no tilt-boat or

* In 1849, the value of the guano imported was 507,262*l.*; in 1850, 707,633*l.*; and in 1851, about two millions sterling.

* The covered boats similar to the above plied between Newcastle-on-Tyne and Shields, and were called comfortable.

row-barge could take in at one time more than thirty-seven passengers, and three more by the way; nor in any other boat or wherry, more than eight, and two more by the way; nor in any ferry-boat or wherry, allowed to work on Sundays, any more than eight passengers, on pain of forfeiting for the first offence, 5*l.*; for the second offence, 10*l.*; and for the third offence, to be disfranchised from working on the river, and from enjoying the privileges of the Company. "And in case any person shall be drowned, when a greater number of passengers is taken in than is allowed, the watermen shall be deemed guilty of felony, and transported."

Every tilt-boat was to be of the burden of fifteen tons, and every other boat or wherry three tons: the wherries were also limited to 12½ feet long, and 4½ broad in the midship: those not agreeing with this scale could be forfeited.

An idea of the value of some of the ferries in the Thames may be formed from the circumstance that in 1766, the committee of the New Blackfriars-bridge agreed to invest the Watermen's Company with 13,650*l.* Consolidated 3 per Cent. Annuities, to satisfy them for the loss of the Sunday's ferry at Blackfriars, which was proved to have produced, upon an average for fourteen years, the sum of 409,210*l.*

It must be granted that the above notes show that fares, as regulated by the Watermen's Company, were moderate, and the regulations excellent; but 100 years since, the cost of traffic above bridge was enormous.

Respecting the stops, dams, or locks, on the Thames, Maitland, in 1756, says:—

"For though the Thames is said to be navigable for 138 miles above bridge, yet there are so many flats in that course, that in the summer season the navigation westward must be entirely obstructed for want of water when the springs are low—a misfortune not to be remedied by any other means than by locks—or certain machines called weirs — placed quite across the river, and so contrived as to confine the current of water as long as found convenient—that is, till the water rises to such a height as to allow depth enough for the barges to pass over the shallows, which being effected, the confined water is set at liberty, and the loaded vessel proceeds on its voyage until another shoal requires the same contrivance to hurry it forward; a great convenience, but the charge attending it is the subject of great complaint amongst the bargemen, being obliged to pay near 14*l.* in one voyage, if the barge passes through all the locks to and from London."

It is not worth while to give a list of all the locks. We may, however, mention, that the cost of a vessel passing the weirs, &c. from Lechlade to Oxford, a distance of 25½ miles, was 14s. 6d.: from Oxford to Bolter's Lock, 53½ miles, was 11*l.* 3s. 6d. or about 4s. 2d. a mile: at Kingston-bridge a further charge of 10s. was made. At Kingston the cost for locks, &c. from London to Lechlade, was about 13*l.* for each vessel.

We have already mentioned various enactments against the encroachments on the Thames, the extent of which may be partly seen by reference to fig. 2:—A, is the Tower; B, London-bridge; C, Wapping; D, Blackfriars-bridge; E, St. Saviour's Dock. The dotted line shows the direction of the old water wall of the city: it is therefore evident that all on the south has been taken from the river. The sketch is from a plan of 1771, and shows the Tower ditch completely surrounding the fortress.

On the north side of the dotted line we have amongst other old names, Addle-street, St. Peter's-hill, Old Fish-hill, Bread-street-hill, Garlic-hill, College-hill, Dowgate-hill, &c. On the other side are Blackfriars-stairs, Puddle-dock, Castle-street, Paul's-wharf, Trig-stairs, Queenhithe, Three Cranes'-stairs, Steel-yard-stairs, Coal-harbour-stairs, &c. East of St. Catherine's-lane, towards Wapping, the only places of old name near the present margin of the river, marked in this map, are St. Catherine-street, St. Catherine-lane, Pillory, Red-cross-street. Of places smacking of more modern times we have Artichoke-lane, Virginia-street, James's-rope-walk, King-street, Green-lane, Nightingale-lane, &c. On the edge of the river we have that far-famed landing-place, Wapping-old-stairs. There are also Wapping-new-stairs, Execution-dock, King Edward's-stairs, and King James's-stairs.

We have no distinct authority respecting the exact line of the river dyke from the Tower across the marshes of Wapping. It is, however, stated that about the year 1565 divers breaches were made therein, caused by frequent inundations of the river Thames, which were no sooner repaired than another happened in the year 1571, when the Commissioners of Sewers, after viewing the same, were of opinion that the most effectual way to secure the bank of the river in these parts would be to erect houses thereon; to which end ground was taken, and the first foundations of houses laid where Wapping is at present situated.

There is a Harleian MS. (1668) consisting of a roll of parchment of several yards in length, on which is inscribed the report of an inquest held in Smithfield in 1663, on the encroachments on the Thames and streams in the neighbourhood of Limehouse, Stepney, Barking-creek, &c. The damages with which numerous parties were charged, and in most instances fined various sums, were for buildings intruding upon the creeks, broken drains, refuse passed into them, and such like.

At the time when it was proposed to establish the docks at Blackwall, it was suggested that the Isle of Dogs should be devoted to the new docks: there were then only two or three houses on the island, and parties came forward who gave evidence of the *dryness and salubrity* of the place. Much discussion arose respecting the cutting a channel from the Thames to the docks, many fearing that it would cause a greater obstruction to the river than was at that time complained of in this part. The Isle of Dogs was, however, not eventually approved of, and the East and West India Docks were placed on their present site. Numerous reports, &c. on this subject, will be found by referring to the catalogue of theBritish Museum, under the heading "Thames."

In a report made about this time by Mr. J. Walker, engineer, that gentleman says,—"Whenever small rivers discharge themselves into larger ones, they then form banks and shelvings in proportion to the quantities of soil brought down by them. The common sewers bring down great quantities of soil into the Thames: one of the greatest of these is the principal sewer from Shoreditch, through Spital-fields, Bethnal-green, Whitechapel, Mile-end, Stepney, and Ratcliff, and discharges itself into the river at Limehouse, where it has formed a very dangerous bank of gravel, which has from time to time been brought down by it. The sand is carried farther down, and forms banks at Limehouse-reach."

REFERENCES TO FIG. 1.

A. Chelsea.	I. Islington.
B. Brompton, Knights-bridge, &c.	J. Hoxton.
C. Hyde-park.	K. Bethnal-green, Hackney.
D. Paddington.	L. Stratford, Bow, &c.
E. Marylebone.	M. Poplar and Blackwall.
F. Battle-bridge.	N. Mile-end.
G. Old St. Pancras Church.	O. Deptford.
H. The site of the New Cattle-market.	P. Greenwich.
	Q. Woolwich.

THE CHEMISTRY OF BUILDING MATERIALS.*

The occurrence, in sandstones, of sulphuret of iron, is the cause generally of the unpleasant spots which appear in them. Copperas, or sulphate of oxide of iron, is readily formed in sandstone containing the sulphuret, when the stone is brought to the surface. The air penetrates through the pores of the sandstone, and effects the change. When rain-water brings the sulphate to the surface, then what was originally a green spot soon changes to a dark brown one; in fact, to brown oxide of iron, or iron rust. The less of all such things the better. The mica makes the stone more easily split: the clay destroys its tenacity and homogeneousness: the vegetable matter irregularly blackens it: the iron pyrites stains it after exposure to the air; and, if there be soluble substances, as potash, these promote vegetable growths; therefore, the more uniform, crystalline, hard, granular, and unmarked by dark spots, or glistening particles, or iron pyrites, a stone is, the better fitted is it, in the estimation of a chemist, for building with. A notion seems to prevail among builders and architects, which is largely warranted by the style adopted by writers on the subject, that stones like sandstone, known to have been produced by particles originally derived from older rocks, have some cement uniting together the little grains, and converting them into one mass. Now, no doubt, we have rocks thus cemented, as we see in pudding-stones, and brick-stone or laterite, and as we shall afterwards see when we come to mortars. Unquestionably there are certain bodies, such as lime, clay, and oxide of iron, more or less present in even those stones or rocks which we speak of, as if entirely consisting of something else, and these substances have a remarkable cementing power. But certainly the notion of the need of cement has been carried much too far, for what is it that cements together the particles of cement? Is there some cement within cement, and some cement again within that? There was a similar notion in Sir Isaac Newton's time in reference to chemical combinations, and it was a puzzle to know how an acid could combine with an alkali. This idea of a necessary cement is one which has too much prevailed among writers on architecture, Professors Daniell and Wheatstone leading the van in the matter. I do not pretend to say, that there are not cementing bodies distinct from the other components of a stone in many cases, but I think it a matter of great importance to say, that there is no need for supposing that such cements always occur. The most homogeneous rocks which the chemist or natural philosopher would prefer for building stones, are those which are least likely to have, and in which one would least desire to have, any such cementing matter. There is no point on which we can more confidently speak than this, that the particles of a powder will of themselves, without any cement of any kind, by mere pressure, and still better if, in addition to pressure, you supply heat, aggregate into a solid mass. In illustration, I may refer to the conversion of snow into a glacier. It is true, that the objection may be made, that there is a plasticity in snow favouring the union of its particles. But let us take blacklead powder. Probably most artists are aware, that their blacklead pencils are now no longer cut out of blocks of native blacklead or plumbago, these blocks having become exceedingly scarce and very costly. Instead of using this, coarse blacklead is taken, ground to very fine powder, rammed into a mould without any gum or cementing material, and merely subjected to a strong pressure: it comes out a solid mass, which can be cut into pencils like the native block. In the same way clay powder is now compressed into tiles for tesselated pavements: in the same way we can consolidate silica powder. There is no reason, therefore, why we should insist on cement occurring in sandstone; and when reporters state that the fine quartz grains in the Craigleith stone have a silicious cement, they are only saying that silica is cemented by silica; *i.e.* that a thing is cemented by itself. The truth is, that the best sandstones are those which simply have their particles compressed together closely, even though the particles are pretty large, as in a grit, and where they only touch each other at certain points. Once brought close together by mere compression, they adhere with a tenacity which the most powerful force can hardly overcome. We can imitate that result with the polished surface of glass. In our laboratories we may find, that if the stoppers of bottles are too nicely ground, and fit the neck of the bottle too neatly, they cannot, when once put in, be got out. You may make the same experiment by putting two panes of glass together, and firmly clamping them once, after which they will not come asunder; but, as has been found in the polishing of plate glass, they so cohere that you may saw them at right angles to their surfaces, and even polish their edges without separating them. I wish, therefore, that the notion of cement were

* See pp. 435, 447, and 460, *ante*.

laid aside, and that the builder would see that the less of foreign matter the greater the solidity, the tenacity, and the enduringness of a stone.

As far as regards sandstones, they are almost devoid of soluble matter. The great objections to them are the difficulty of hewing them, and the injury to the workmen's health in chiselling them,—this injury mainly occurring from the fact, that the very fine powder, into which the sandstones chisel, is alike irritating and irremovable. Chemists like myself are largely exposed to irritating agents, such as gases, acid vapours, and fumes of various kinds; but though their action is a very marked one, and chemists may suffer from affections of the lungs in consequence, still these vapours are sooner or later absorbed in the system, if their action is survived; but if the fine powder of silica dust once enter the lungs, it remains there like a foreign matter—like the fine steel dust from which the Sheffield knife-grinders and sword and razor sharpers suffer; continually exciting inflammation, irritation, cough, and ultimately consumption; and it is so notorious to hear of masons perishing early, who are solely employed in hewing, that I found one of them not apparently able to conceive of a mason surviving his wife. He spoke as if every one of them must of necessity leave a widow, and as if the notion of the husband living the longest was not to be thought of. The Rev. Dr. Nisbet lately devised a horn respirator, manufactured by Messrs. Blackhall and Scott, to save the masons inhaling this fine dust; but it would have needed also to cover the nostrils to have been of great service. Besides, you cannot give a man whose lungs are healthy, a respirator to wear all day long without enervating him. You compel him to breathe a warm air to which he is not accustomed, and it comes to a question, whether you do not do more injury to the lungs in one direction, than you prevent in another. Respirators are most serviceable to those whose lungs are injured, but no one would recommend a man with stout lungs to begin wearing one. No remedy has yet been introduced which the workmen have been found willing to adopt, while the moustaches and beard are but imerfect respirators. As already hinted, the only effectual mode of doing good, is so to arrange their sheds, that the hewers may be saved from the fine dust entering their lungs; and that, as much as possible, they should only work at these hard stones in summer, when they can chisel them in the open air.

It is quite enough to say, that sandstone is *one* of the best building stones, without saying that it is *the* best. In Scotland, we have little experience of the use of limestone as a building stone; but when one finds, that to a great extent the architects have preferred a limestone for the Houses of Parliament, certainly I would not be dogmatic enough to affirm, that sandstone was necessarily better.

The other silicious stones can be disposed of in a word. Under the head of basalt, trap, or greenstone, we include igneous rocks—that is, rocks which are believed to have been melted by heat, like the volcanic lavas, and afterwards consolidated. There are only two of these rocks I shall stop to mention. The one is basalt, a dark rock, very prone to throw itself into the columnar form. The other trap rock is what we call whinstone, or greenstone. It is mainly used as road metal, in the causewaying and Macadamising of roads. It is occasionally employed as a building stone, but there is an objection to its use as such, from its difficult working, its hardness making it difficult to chisel. No one calls it a freestone. Its dark colour also makes it objectionable in our climate. I wish, however, to direct attention to a softer greenstone, which is applied to a curious use in some countries and even in our own. It is called in our neighbourhood "Leck" stone. It is very soft for a trap rock, and it has not the ordinary objection made to trap rock, namely, its difficulty of cutting. Even with a knife one can cut it with little trouble. It is very smooth, and when you rub it, the surface has a soapy touch. These stones are preferred for the insides of bakers' ovens, and for other places to which heat is to be applied. A stone of the same kind is largely used in Norway for the insides of furnaces. It has a remarkable power of resisting heat, such as the ordinary greenstones have not, and is less liable to crack and break, or give way, when so employed. Some such stones are also used in Lapland, Norway, and India, for making pots and other vessels used in cooking. The peculiarity of this class of greenstones is, that they contain silica, and in addition, a large amount of magnesia. Magnesia is one of the most infusible bodies we know, and when united with silica, it forms a kind of stone more suitable than any other for resisting high heats.

A very beautiful rock is now coming into use as a building material in England and elsewhere, called Serpentine, from its being mottled like a serpent's skin. Those who visited the Great Exhibition, or have seen the Government Museum in Jermyn-street, London, may remember seeing large blocks of this serpentine. It consists of little else than silica, magnesia, and oxide of iron, the latter of which serves to colour the stone green and red. It is a soft stone, not very suitable for out-door exposure, but admirable for inside pillars. It is more easily wrought than marble, and is exceedingly beautiful. A rock analogous to serpentine is used as a building stone in our own country. It is the stone of which Inverary Castle is built—but is found on the opposite side of Lochfyne. It is of a bluish colour, and so soft that it can be cut by a saw. This stone is used in Glasgow like "leck" stone, for bakers' ovens; and if touched, it will also be found to have a soapy feel.

This curious class of stones consists chiefly of silica, much of which is present in a body much softer than mica, called "Talc." Talc has something of the look of spermaceti, and when touched feels soapy. The Inverary stone has the peculiarity of being pliant, and of being easily cut and sawed into mantlepieces and the like, by much simpler tools than are used for even our freest freestone. It hardens a little by exposure to the air, but never becomes very hard, yet it is capable of resisting much higher heats than harder stones.

The last class of silicious stones, which I merely name, are slates. They are the muds of worn-down rocks, converted by a process of consolidation into slates. Let us take, for example, the manner in which granite is ground down. It is sometimes ground down as a whole, and all its three constituents, quartz, mica, and felspar, deposited together. The rock of this finely-powdered matter, is called Gneiss, which may be regarded as granite, made up again into a solid stone—laminated as all these rocks are, showing that they have been deposited in water, and often also twisted and contorted by exposure to powerful forces. One can see the white felspar here and there, the glistening, shining mica, and, with a microscope, even the crystalline grains of quartz. It more often happens, however, that granite is reduced to a coarse powder and carried along in a stream, its ingredients becoming separated owing to their different density. The felspar in granite becomes a fine clay, and is carried furthest by the stream; the quartz, which is heavier, remains behind, and may form a sandstone. The mica is carried on further than the quartz, and very often predominates in sedimentary rocks, forming shining micacious schists. The name of Shale is given to a consolidated clay; when it gets hard, it is called a schist, and if very hard a slate, though in truth shales, schists, and slates, suffer imperceptible gradations into each other. They, however, have one character in common — they all have a more or less laminated or foliated structure. In other words, they are made up of leaves like mica. Occasionally, nay, frequently, they change, and all lamiuation ceases, and thus they form flagstones or clay-stones. They are easily wrought, and sometimes used as building stones, as in Wales, but more frequently as paving stones. The term slate or schist is restricted to the hard muds when they present a splitting character, which makes them suitable for the roofing of houses. Without entering into their derivation from other rocks, I will only notice, that in many roofing slates mica predominates. Clay alone, thoroughly consolidated, forms the best roofing slates; so that in many parts of the country these splittable stones are called tile-stone.

LIBRARIES, LECTURES, AND READING-ROOMS FOR VILLAGES.

A CONVERSAZIONE, in connection with the Berks and Bucks Lecturers' Association, was held on the 25th ult. in the Town-hall, Windsor, on which occasion the walls were covered with educational drawings, lent by the Society of Arts, the Working Men's Educational Union, and the Hants and Wilts Educational Society.

The Mayor (Mr. Clode), presided, and introduced the object of the meeting. He then introduced,—

The Hon. and Rev. Samuel Best, who described, at considerable length, the means which had been taken by the Hants and Wilts Educational Society, a kindred institution.

He said they had procured a large stock of geological drawings and diagrams illustrative of geology, anatomy, mechanical powers, &c. About 150*l.* had been expended on drawings, models, and books, although they had not as many of the latter as they could have wished. The next thing was to secure the service of lecturers. About eighteen gentlemen lectured for the last year, and this year they had about thirty-five lecturers, while the number of lectures would be between 160 and 200. The operations of the society had, in the first instance, been confined to four parishes in the north-west of Hants. Then they took in the whole of the county, and eventually, Wiltshire. All this had been accomplished within two years. With a view of creating an interest in the proceedings of the society among as many people and in as many districts as possible, they held their meetings alternately in Winchester, Salisbury, and Southampton. Books they were enabled to obtain at a reduction of twenty-five or thirty per cent. The institution was perfectly unsectarian in its character. Their great object was to promote the education of adults. They had divided the work among three secretaries,—one attended to purchases, &c. of books, another to the reading-rooms, and a third to the arrangements connected with lectures. Thus they had invaded some of the rural districts, in which ignorance prevailed to as great an extent as the warmest friends of ignorance could desire. Some people might think such proceedings pregnant with evil. What a shocking thing it was to teach a nursemaid, who took charge of their children, to speak good grammar! Those children might, at some inopportune moment, bring out some awkward expression which had been taught them in the nursery. What a heinous offence it was to enable ploughboys to understand the principles upon which the steam-engine or a thrashing-machine, which he would be called upon to work, was constructed! If they stopped the impartation of education at ten or twelve years of age, it would be impossible to teach such "common things" as common sense required.

Mr. Godwin said, the importance he attached to the object prevented him from declining the invitation sent him. Many persons would attend a library to read books who could not be induced to join a class in a mechanics' institution, or regularly to attend lectures. In this respect he believed that the amended Act of the last session, with the view of enabling towns to establish museums and libraries, would prove to be a great boon. To increase the facilities of obtaining good books was of the utmost importance. Books, as Wordsworth says, are,—

> "A substantial world, both pure and good:
> Round these, with tendrils strong as flesh and blood,
> Our pastime and our happiness will grow."

The opportunities which these libraries would afford children who had been brought up in our national and other schools, to read, would be the means of enabling them to preserve what they had learnt, and to perfect their education. It was never intended that man should devote all his powers to the maintenance of his animal existence only. Although it was necessary man should work to live, it was not intended he should live merely to work. The progress of events greatly tended to shorten the hours of labour, so that man might be enabled to devote his time to mental improvement and the benefit of his fellow men. After alluding to the wonderful progress which this age has made in science, to photography, which enabled the countenances of those who were so bravely fighting our battles in the Crimea to be handed down to posterity, to the still more wonderful invention of the electric telegraph, by means of which the directors of the East-India Company in London could, in an incredibly short space of time, communicate with the millions of inhabitants peopling

that vast empire, the speaker proceeded to observe that it was the fashion among some people to despise the theorist, and talk contemptnously of his projects: they said that they wanted "practical men." The practical man was to be admired, but he would not, on that account, say that "the thinker"—the theorist—did not produce an equal amount of benefit to the community. All these mighty projects—these conquests of mind—to which he had referred, a very few years ago were simply "dim obscure thoughts" in the minds of men who would be deemed mere theorists. They thought and pondered, and laboured hard to perfect these wonderful inventions, and having perfected them, thousands of practical men employed their powers to carry them out. The mere practical man could make no progress without the theorist, who could aid him in the application of his practice for the benefit of his fellow men. It had been argued by some that Bacon had never given expression to the sentiment 'Knowledge is power;' but whether he had used it or not, its truth, to a great extent, could not be controverted. Look at the simple question of the preservation of health. What lamentable ignorance and indifference prevailed in reference to it. Science pointed out the way to remove the causes of poverty, crime, disease, and death. Knowledge here was power over life and death. The public had only lately begun to appreciate the fact that drainage and pavement in a town would save hundreds of lives annually. He would venture to say that to drain and pave is to raise and save. It was better that the state should expend large sums of money to educate the people in these matters than to expend them on gaols and policemen. It was not only the interest, but the duty of the state to educate the people.

Mr. Charles Knight said forty years ago, as a young man, he had, in conjunction with his revered father, attempted the establishment of a newspaper in this borough. That journal still existed, and he was glad to state that it was carried on in a highly honourable and creditable manner. He looked back to that period and compared it with the present. That comparison afforded a striking illustration of the advancement of knowledge and the progress of the community, although at that time the success attending his efforts were as great as could be expected from the then condition of society. After some further observations, Mr. Knight remarked that he noticed the presence of one respected gentleman (Mr. Bedborough), a former fellow-townsman, who could well remember the period of the Peninsular War, and the extraordinary excitement with which it convulsed society. At that time people did not celebrate their rejoicings in quite so moderate a manner as those of the present generation. Notwithstanding the great interest excited in the minds of the middle and upper classes at that eventful period, the mind of the agricultural labourer appeared to be almost unmoved by what was passing around him. He was glad to observe that some vigorous efforts were being made to improve this class. He had not the advantage of living long in the country, but he was sorry to learn that in many districts—indeed, there were very few exceptions—the only place of resort which this class had, after the day's labour, was the beer-shop. No doubt could be entertained on the point that that was about the worst school he could have. The object of societies similar to that they were assembled to promote was to provide him with means of recreation, amusement, and instruction, in lieu of the beer-shop. The great improvement which had taken place was in a great measure due to the newspaper press. He knew of no more powerful engine for the diffusion of knowledge. Some people thought that the agricultural labourer had no business to meddle with such things. Why, they were the very people called forth, by means of voluntary enlistment, to go out and fight the battles of the country, and to suppose that feelings of honour, patriotism, and glory could be promoted in his mind, and kindled in his breast without reading the newspaper, was, in his opinion, absurd. Let him, therefore, read the newspapers: let this be aided by lectures on interesting topics, illustrated by such diagrams as they saw in that room: let him have access to a library, and the agricultural labourer would make strides in advancement almost beyond what they could now contemplate. The fear that the people would be elevated above their own rank, and that they would be discontented with their positions, was rapidly passing away. He would say, let them do their best to develop talent among all classes. Let all have an opportunity to learn. That was not the object of the formation of societies of this character: it was not to be expected they could convert people into great poets or wise statesmen. They did not attempt to make "village Hampdens" or "glorious Miltons." True genius would develop itself wherever found, but their object was, in addition to producing "a bold peasantry, their country's pride," to have also an "intelligent peasantry," which would be the source of still greater pride.

The Rev. Mr. Tooke next addressed the meeting, and entered into a variety of details with reference to the initiatory proceedings taken in the establishment of the Berks and Bucks Society. The general objects to be obtained, as described by the rev. gentleman, were similar to those detailed by Mr. Best in his description of the Hants and Wilts Institution.

The Rev. Mr. Bent, the Hon. and Rev. Lord W. Russell, and the Very Rev. the Dean of Windsor, also spoke briefly in furtherance of the Association; and some votes of thanks having been passed, the meeting separated.

The exertions of the Rev. Edward Hale, as hon. sec. should not be passed over without mention.

BELLE-ISLAND, ISLINGTON.

In all inquiries into the sanitary condition of the metropolis, the enormous increase in the population must be always borne in mind. We cannot go on in the old fashion with nearly more than two and a half millions of people packed in a limited space. Science has put into our hands various means to meet the requirements which the altered state of the population has caused. It is really difficult to be patient with persons who, in spite of common sense and the opinions of thousands, will persist in saying that we must not do what is right. It has been our object on all occasions to get at the truth. We have heard the tales of the suffering poor, and have weighed the value of that evidence with others. It is painful to do what may in any way damage individual interests, but a duty we owe to the bulk of the community forbids the consideration of this.

We have recently made some fresh inquiries in connection with *Belle-Island*,—a place so wrongly named,—and will for the present mention a few facts:

On this spot thirty gentlemen are engaged in various trades,—such as soap-boiling, and the manufacture of artificial guano. There is on the island a population of 320 persons, or nearly that number of men, women, and children, while towards the east there live closely adjoining 60,000 people. In other directions there are masses of persons, and much valuable property, who are injured by the doings in the "island."

The manufacturers there say that all their works are perfectly wholesome: the surrounding people are of a very different opinion. It is difficult to give an idea of the extent of the nuisance. On all sides we hear: "It is shocking;" "Why should we be poisoned, when we pay rent and parish rates?" "It is worst when most people are asleep: why should we be poisoned in our beds?" "It is of very little use shutting the windows." Strangers who come into the neighbourhood often exclaim against the odour. "I have lost some of my best tenants," says a neighbour: "they cannot put up with it, and others have given notice to quit;" and then one chimes in, "Yes, but you should get up about 3 o'clock in the morning: they are artful."

Some of the inhabitants of the island, and the manufacturers, are the only persons who say a word in defence of the present occupation of this neighbourhood. The greater part of the 320 people are engaged in the various works, and "Where in the world can I go with these little children," says one of them. "On one occasion such a smell came out of that place that we went out and cried 'Shame!'" The thousands of persons surrounding Belle-Island say "Shame!" At a meeting of the inhabitants on this subject, a gentleman connected with the parish stated that about twenty-five or thirty years ago an action was brought against a varnish manufacturer of Belle-Island. The judgment was that the circumstance of the pollution of the air by any unpleasant smell was an offence. It would seem, however, that the law is not effective, for though vigorous steps have been taken in Islington, they are at present without effect. Something surely should be done to relieve this crowded and increasing neighbourhood.

Thames Tunnel.—The amount of tolls for the week ending 29th September, 1855, was 68*l.* 8s. 3*d.* derived from 16,419 passengers.

NUMBER 21, FLEET-STREET.

There is an advantage attending the use of the material of which the houses in London are generally built, which is useful in its way to this extent, that when they begin to give such evident symptoms of decay that there is no gainsaying the fact,—there is nothing for it but to consign them to the professional housebreaker, carefully remove them, and make room for a new creation adapted to the wants and requirements of the present day,—an advantage not afforded by those cities that seem built as if they would endure for ever, and gradually become more interesting to the archæologist than the sanitary reformer. The premises that formerly occupied the site of the building we illustrate this week, on the 14th of September, 1853, owing to some alterations in the house adjoining, gave such hints of their intention to give up by settling down, that the district surveyor was sent for in a great hurry, which led to a call for shores and hoarding, the result of all which was a clearance, and the letting of the site for a term of 80 years to the Directors of the London and Provincial Law Assurance Society, at a ground-rent of 84*l.* per annum. The frontage next Fleet-street is only 18 feet from centre to centre of party-wall, which would give the letting as at the rate of 4*l.* 13s. 4d. per foot of lineal frontage, or, the depth being about an average of 110 feet, at the rate of 1,341*l.* per acre per annum,—one more proof of the great value of sites within the City when they abut upon the leading thoroughfares.

The Directors having approved of the design and plans of their architect, Mr. John Shaw, of Christ's Hospital, called for tenders for the erection of their new premises. The result showed, in a select competition, Messrs. Locke and Nesham the lowest, at 4,988*l.* The Directors used a wise discretion, and adopted stone as the facing material,—that from Swanage, in the Isle of Purbeck, a stone which has good reputation.

The character of the architecture, as will be perceived, is Italian, of the Palladian school, and by the treatment of the return flanks of the party-walls, an extension of front is obtained, not to be expected from the limited space at the architect's disposal. A strongly marked rustic basement raises the ground-floor four steps from the pavement, and a Tuscan rusticated order of lighter cast than the basement, with an archivolt, gives elevation to the story required for the public offices. The first floor is Doric, the second Ionic; and this floor, which is the drawing-room of the resident manager, is marked by a balcony, having carved trusses and ornamental iron railing. Another feature on this floor is the oval windows, with droops of flowers. The top floor is Corinthian in its order, the line of the caps being filled in with masks and festoons of flowers. The attic floor being thrown back, is not visible from the street. The elevation finishes with the attic of the order having vases over the pilasters at the level of that floor.

In the arrangement of the plan care was required, the clear space between the walls being only 16 feet 6 inches. Entrance to the private residence of the manager would have fatally cut up the public office. This entrance is therefore carried under the office in an arched passage, lit in compartments from the floor above, and leads to a stone staircase in the rear, which gives access to the upper floors. The public office, which is 16 feet 6 inches wide, 23 feet long, and 15 feet high, has its walls and ceiling panelled in Parian cement. The manager's room is immediately behind the public office, having a private door from the staircase already mentioned, and also a communication with the corridor leading to the board-room, which is also arched and divided by pilasters into compartments. The board-room, with a physician's room and a lavatory, cover the remainder of the site, so that all the ground-plot is built over. The board-room is 36 feet long and 15 feet high. It is divided into three parts by Ionic pilasters, and the walls and ceiling are panelled in Parian. Light is introduced through ground-glass plates, which fill the ceiling panels.

LONDON AND PROVINCIAL LAW LIFE ASSURANCE COMPANY'S, FLEET-STREET.——Mr. John Shaw, Architect.

CHURCH-BUILDING NEWS.

Croydon.—An east window of stained glass has recently been placed in St. Peter's Church, Croydon. The work was executed by Mr. William Holland, of Warwick. The window is in the Decorated style. The five bottom lights contain figures of the Evangelists, St. Matthew, St. Mark, St. Luke, and St. John, standing under decorated canopies; and the centre light St. Peter, to whom the church is dedicated. Underneath each figure are their respective emblems, with an inscription in Latin. The openings are in tracery, with angels bearing scrolls, playing upon musical instruments, &c.

Easthothly.—The exterior of the new church here is approaching completion, the rafters being affixed ready to receive the roofing; and the interior is in a state of forwardness at Messrs. Cheale's workshops at Uckfield. Mr. Cheale is the architect. It is at last decided to remove the remainder of the old chancel.

Windsor.—The local *Express*, in reference to new churches in the neighbourhood, states that active exertions are being made by the vicars of Datchet, Egham, and Ashford (near Staines), to obtain the necessary funds for the erection of new churches in their respective parishes. At Datchet and Ashford it is proposed to replace the present structures with larger edifices. At Egham, an additional church at Englefield-green is contemplated, towards which the sum of 1,400*l.* has already been raised by the Rev. J. B. Monsell. Her Majesty has contributed 100*l.* towards the proposed church at Datchet.

Aylesbury.—A second painted window, the gift of Mr. Z. D. Hunt, has been placed in the north chapel of the parish church of Aylesbury. The centre figure represents St. John the Baptist, with a lamb at his feet, and a cross in his hand, pointing upwards to the motto "Behold the Lamb of God," &c. On the sides of the motto are the Greek letters Alpha and Omega, and on the sides of the principal figure, in ancient Greek characters, are the monographs, representing the names of our Saviour, "Iesous" and "Christos." The artist was Mr. J. G. Waller. The new window now being erected in the chancel will be completed in October. It will be of painted glass.

Buttermere (Wilts).—The parish church having become very dilapidated, it was resolved to take down and rebuild the same on a more extended site, and the new church is in course of erection. The nave and chancel are under one roof, with a wooden bell-cot at the intersection. The style is Geometrical Decorated. The builder is Mr. Salisbury, of Newbury, and the architect, Mr. Withers, of London.

Weston-super-Mare.—On Wednesday before last Lord Auckland, Bishop of Bath and Wells, consecrated the new edifice called Christ Church, situate on Montpelier, in this parish. The church is in the Gothic style, from designs by Messrs. Manners and Gill, of Bath, and is capable of accommodating 525 persons, including 250 free sittings. Mr. E. Gregory was the builder.

Bristol.—It appears that owing to a pressure of circumstances, the annual meeting of the Canynge's Society, which for some years past has been a means of directing special attention to the slowly-progressing renovation of St. Mary Redcliffe church, will not take place this year. The architect has addressed a letter to the Restoration Committee, wherein he says,—"I think it my duty to remind you, and through you the public, of the dilapidated, and, indeed, dangerous state of the structure. I have cried 'Wolf!' several times, and accident has not followed, but it must not thence be concluded that no danger threatened or threatens. The flying buttresses on the south side of the nave and some of the windows are in so bad a condition, that although they *may* continue for some time yet to hang together, parts might, on the other hand, fall at any moment. Of the state of the turrets at the foot of the spire I have already spoken on more than one occasion, and this is now even worse than it was. One of the small shafts in the front of the south porch fell a few days ago: had this happened while the congregation were leaving the church, serious consequences might have been the result. The prosecution of the work on which the committee are engaged is not simply a matter of taste and feeling: it does not afford a question which the friends and opponents of restoration generally might discuss; but is a matter of absolute necessity, about which no time should be lost." He adds,—"We have cleared away the temporary screen from the south transept, so that what we have been doing recently may now be seen, including the Ladies' Window. I have reason to think that the latter will be considered, by all, creditable, alike to the liberality of the donors and the skill of the glass painter."

Bath.—It has been determined that an obelisk shall be erected in the Abbey Cemetery at Lyncombe, to perpetuate the memories of the officers connected with Bath who have fallen in active service during the present war. The site of the intended monument is considered eligible, and has been given by the rector and churchwardens, who have likewise relinquished payment of all fees otherwise attached to such an erection.

Blackburn.—St. Alban's Roman Catholic Chapel has recently undergone a revivification internally. It has been painted and decorated, under the directions of Mr. Ellwood, of Blackburn, and Mr. Austin, of Liverpool. Four figures have been added to the number wherewith the walls of the chapel are decorated: they were painted by Mr. Austin from some German designs. The subjects are,—St. Alban, Our Saviour knocking at the door, "Our Lady of Sorrows," and "Our Saviour crowned." There are also three figures in the dome, by Mr. Austin. The cost of the decorations is about 165*l.*——At a late meeting of the Burial Board, Mr. R. Ibbotson's tender for the construction of the fence walls at the projected cemetery was accepted.

Carlisle.—The foundation-stone of a new Presbyterian Church, in Fisher-street, was laid last week. The old building was pulled down a few weeks ago. The new building will be in the Norman style of architecture, and will occupy the site of the former structure. It is intended to accommodate between 600 and 700 persons, and will have a school-room beneath. Mr. Stewart is the architect, and the work has been contracted for by Mr. T. Jones, builder.

Gateshead.—The parish church of St. Mary, Gateshead, which, by the memorable explosion of the 6th October, 1854, was sorely rent and shattered, has since been restored, under the direction of Mr. Dobson, of Newcastle, architect. The sash windows, and other barbarities, says the local *Observer*, have disappeared, and the venerable pile has reassumed its ecclesiastical aspect. The uncouth tower of the eighteenth century remains, serving as a foil to the church; and there are other excrescences—but not so obtrusive. The contractors were Messrs. Kyle. 1,127*l.* 9s. covered the work comprised by the original contract. But there are extras. In the progress of the works, the S.W. angle of the transept was found to be much decayed and shaken, and required to be taken down. The under-part, too, of the chancel wall, which was to have remained intact, proved to be defective; and when it was removed, the discovery was made that it was built on the surface; so that foundations had to be laid before the wall could be rebuilt. A memorial window was projected, to commemorate the necessity of the restoration; and one of the townsmen having offered 50*l.* towards Mr. Wailes's charges, the window was ordered, in reliance on the readiness of the community to defray the cost. Thus there must yet be raised some 200*l.* or 300*l.* to defray the cost of the extras.

Glasgow.—The repairs and alterations in the Glasgow Cathedral are now nearly completed, and a great change has been effected in the appearance of its interior. The organ screen, or gallery, says the local *Gazette*, is a great obstruction to the view from east to west, and though a comparatively recent erection, it has no chance to be removed; but the walls, pillars, and roof having been all cleaned and refitted, where that was necessary, present an appearance such as no other building now existing in Scotland can exhibit.

THE LINCOLN DIOCESAN ARCHITECTURAL SOCIETY.

The autumnal meeting of this society was held at Newark, on September 24th, Sir Charles Anderson taking the chair.

The Rev. J. F. Dimock read a paper on the documentary history of the fine parish church of this town, and Mr. G. Gilbert Scott followed with the architectural history; the two papers mutually illustrating each other. The party then adjourned to the ruins of the castle, built by Alexander, Bishop of Lincoln, in the twelfth century, and the scene of the death of King John. They afterwards went to the church, where Mr. Scott, who has recently directed its restoration, gave a peripatetic lecture on its architecture. Almost every style was illustrated by one portion or other of the fabric. The crypt, and some portion of two piers in the centre of the church, were contributed by the period of transition from the Norman. The Early English gave the lower portion of the tower; the Decorated, the upper portion, the lofty spire, and the south aisle of the nave, with some fragments at the east end. Then came the Perpendicular, furnishing the spacious chancel with its aisles, and also the nave and its north aisle; and at the period of the Tudors giving the transepts.

In the evening, another meeting was held; and Mr. Bailey, architect, read a paper on some of the churches of the neighbourhood, which was illustrated by drawings: these were presented by him to the society. Sir Charles Anderson then read some observations on cottage architecture, which elicited from Mr. P. Thompson, the historian of Boston, an offer of 5*l.* for the best plan of a cottage that should combine economy in construction with the accommodation requisite for a family. Mr. Scott afterwards read some remarks on the present state of our domestic architecture.

On the following day, an excursion was made to some of the churches of the neighbourhood,—Balderton, with its well-known Norman porch, and carved bench ends, and Claypole, with its fine tower and spire, and its Decorated foliage round the capitals of the piers. The font is much like the one at Heckington. In the sacristy is the original stone altar. Pity that this church should not be better cared for. The reading-pew is on low wheels, with a view to its being moved to the north or south side of the aisle, according as the rector of the north or south mediety officiated. The next church visited was Doddington, whose tower and broach spire appear toppling to the ground. Then came Westborough, Bennington, and Staunton; the last recently restored, but not in the most satisfactory manner. The excursion terminated with Hawton, where Mr. Place, whose drawings of the sedilia and Easter sepulchre have rendered them well known to the architectural world, gave the party an exposition of the beauties of the Hawton chancel.

PROVINCIAL NEWS.

Lynn.—The New Assembly-rooms here were opened on Wednesday before last by a grand concert, under the patronage of Sir S. M. and Lady Peto. The room thus opened for public purposes is situate in Crown-street, and occupies the site of the old theatre, a part of the walls of which, through the arrangement of the architect, Mr. Glover, have been worked up into the present building. The concert-room is approached by a hall having on the left a committee-room, and on the right a room for the clerk to the magistrates. The room is 50 feet long, by 26 broad, and 16 high.

Cambridge.—The Working Men's College is being formed at the rear of the premises at Market-hill. It consists of a suite of three class-rooms, separated, or rather united by folding-doors, and forming, when opened up, one large hall, or lecture-room, capable of accommodating 200 persons. Ventilation and warming have been attended to, and the college will shortly be opened with evening classes.

Bristol.—A meeting to promote the establishment of day schools in connection with the Wesleyan body, was held in this city on Tuesday before last. From a report which was read to the meeting, it appeared that a few

months ago, a committee was appointed to look out for a site on which to erect the proposed schools, and that an eligible one had been fixed upon, which will cost 1,100*l.* It was proposed to provide suitable accommodation for 400 boys and girls, and 200 infants, with class-rooms, playground, and a house for the master. The total cost was estimated at 3,500*l.* Nearly 1,130*l.* had been promised, and a grant of 1,200*l.* was expected from Government, but the latter depended entirely upon the whole of the cost, with the exception of that sum, being previously obtained. Resolutions in favour of further procedure in the matter were unanimously passed, and a list of the subscriptions already obtained was read to the meeting.——The firm of Messrs. Jones and Co. have completed their building in Wine-street. The front elevation is in the Early Venetian style at the period when it was advancing towards the Palladian school of architecture. It is 50 feet long and 50 feet high, and consists of bronze and plate-glass fronts 16 feet high, two stories of columned arcades above, built of Bath stone, brick, and glass, and finished by a panelled attic story, the panels in which give light and ventilation to the rooms behind the parapet. The shop, from front to rear 100 feet, having galleries around, and the area of the floor, exceeds 12,000 square feet, exclusive of those floors to be used for domestic purposes, and which embrace various recent improvements, having shower and slipper baths, reading-rooms and lifts. Upwards of 3,500 feet of glass, 100,000 feet of deal, 5,000 feet of mahogany, and many tons of iron, have been used in the construction of the building, and it will be lighted by 320 gas lamps. It will afford accommodation for more than seventy persons, employed by the firm. The architectural plans for the building were drawn out by Messrs. Pope, Bindon, and Clarke. The masonry was executed by Mr. Lee; plastering and painting by Mr. Dimond; carpentering by Mr. Brooks; glazing by Mr. Williams; iron work by Mr. Allen; plumber's work by Mr. Tuckey; and gas fitting by Mr. Harris.

Bath.—The improvement of the Bath Corn-market was prayed for in May last, in a memorial presented to the Town-council, and signed by 137 farmers and others attending the market. The subject was referred to a special committee, who obtained the sanction of the council to expend 1,000*l.* in enlarging the corn sheds, or erecting a new building. It was resolved that a new corn loft should be erected. The contracts were let to Messrs. Morgan and Lovell, joiners and builders, and the work is now advancing towards completion. The site of this new corn-loft is on the left-hand side of the market, where the sheds for exhibiting corn formerly stood. The building will be 167 feet long, and 18 feet wide. It will have an entrance into Walcot-street. At one end, nearest Walcot-street, will be a separate room, 16 feet by 22 feet, appropriated for the exhibition of small seeds. The interior will be lighted by twenty-seven casements, extending the whole length on each side, and further light will be admitted by filling in the space under the eaves of the roof with glass. Ventilation will be secured by perforated zinc plates inserted in the roof, and, to keep out cold, a coating of air-felt will extend along the roof between the slates and the boarding. The roof in the interior will be quite open and constructed of stained wood.——A project for a hot-water fountain in the Abbey churchyard has been sanctioned by the City Act Committee, and by the house-owners and occupiers of the neighbourhood, and the architects of the city are to be written to for designs for the proposed erection.

Priddy.—The first school-house ever erected in this small rural parish was opened on Friday before last by the bishop of the diocese.

Halifax.—One of the tallest chimneys in this neighbourhood has just been completed at Deanclough. It is an octagon shaft with a square base, each side of the base measuring 21 feet. It gradually tapers off, so that the diameter at the top is reduced to 10 feet 6 inches. The flue is cylindrical, of equal dimensions throughout, that is, 11 feet in diameter. Its height is 264 feet 6 inches, and the ornamental ashlar work at the top weighs 70 tons 9 cwt.

Sunderland.—The friends of temperance in Sunderland are making an effort to raise a sufficient fund to erect a public hall in the town. Lord Shaftesbury and Lady Williamson are among the contributors.——A vigorous attempt is now in progress to raise 7,000*l.* by voluntary subscriptions, for the purpose of erecting the talked of "Crystal Palace" on Building-hill. Ward sub-committees are being formed, and are said to be meeting with encouraging support from all classes. A public meeting of the inhabitants has been held to give countenance to the project, and it has been received, it appears, with general favour. Upwards of 2,000*l.* were subscribed up to Thursday week, of which the Dowager Marchioness of Londonderry contributed 100*l.*

Blyth.—The harbour works here are being prosecuted with vigour. A large portion of the eastern pier has been commenced, and the river is being dredged. On the sea-banks, near Bath-row, yards have been erected for storing goods, and for blacksmiths' and joiners' shops. It is expected that the western pier will soon be completed.

Jarrow.—The Commercial Docks of the Tyne at Jarrow and Hayhole, on Jarrow Slake, are making rapid progress. The contractors have a large number of men engaged making the approaches, and the locally well-known gibbet, "upon which Jobling was hanged," will soon be levelled to the ground. Embankments are being thrown up previous to the piling for the river wall, which will be forthwith commenced. The contractors have purchased a powerful Nasmyth engine, which will give seventy strokes a minute, and will also drive vertical and angular piles, and make its own road as it goes. The Brinkburn will be taken outside the dock by a covered way, and will be discharged into the Don. There will be at least a dozen approaches from the North-Eastern Railway to the Dock, and the warehouses will be on a large scale. The Hayhole Docks, opposite to Jarrow, are also making progress. More men have to be immediately set to work.

Gateshead.—The corporation of Gateshead have resolved to purchase the property in Hillgate required for the town improvements, to carry out which they further propose to apply to the Exchequer for a loan of 35,000*l.*

Linlithgow.—The improvements upon the park and loch at Linlithgow Palace, according to the *Falkirk Herald*, are now complete. The authorities have now turned their attention to the court-yard of the palace.

THE SMOKE NUISANCE IN THE COUNTRY.

IRON WORKS.

The *Builder* did good service by the efficient assistance it rendered to the abatement of the great Smoke Nuisance in London. The compulsory application of the Act of Parliament has sensibly purified the air, and turned to profitable use countless tons of disintegrated fuel, which (but for its wholesome vigour) would now load the lungs, obstruct the vision, besmear the skin, and begrime the furniture of the inhabitants of the metropolis. So far, so good. An inestimable benefit has been secured; but I must entreat you not to lay down your pen, or to rest satisfied with the partial appliances of a remedy which ought to be universal. "We have scotched the snake, not killed it;" but what has been done in London is certainly feasible elsewhere. In Manchester, Bradford, the Potteries, and other places, the public spirit of individual manufacturers has done enough to establish the practicability of ridding them of the foul pest, but not enough to effect a perceptible diminution of its black and filthy influence, —*that*, nothing but a legal compulsion will ever accomplish, for England is, of all countries in the world, the most pertinacious in her resistance to every scheme, however advantageous, which disturbs the routine of ancient practice. The experiment has been successfully tried in London. In the name of health, cleanliness, and the once fair aspect of this pleasant land, extend it to the provinces!

I make this exhortation as a unit of the general public. How far it may tend to the benefit of my particular case must depend upon the answer, which I hope through your medium to obtain, to the question with which I shall conclude my letter.

I inhabit a midland district, which, notwithstanding its mineral substratum, was, much within my memory, in every sense rural,—green, richly wooded, and blessed with a clear pure atmosphere. The rapid development of its mineral resources in recent years has created and multiplied iron furnaces and iron forges, tall chimneys and coke ovens. Do not suppose me so absurd as to complain that these subterranean riches are not kept locked up in the bowels of the earth. It is quite right, as well as an inevitable necessity, that they should be extracted, converted, and made to minister to individual and national wealth; but if it be a fact that such legitimate objects be achieveable without a hideous desolation, then it is most reasonable to complain of, and seek to arrest, the process by which a beautiful country is being needlessly changed into a dismal sooty wilderness, where the sun is blotted out of Heaven, all vegetation blighted, and every fine old tree converted into a black, withered, leafless skeleton. I have reason to believe that more than one of the proprietors of the works and forges in the neighbourhood would willingly incur any (not unreasonable) expense to stay the plague, if they could be satisfied of the existence of any effectual method of doing so. The question, therefore, which I would address to you,—and you have correspondents whose practical science might enable them to impart the desired information,—is this:—

Is there any peculiarity in the construction of smelting, refining, or puddling furnaces, or of *any* used in the manufacture of iron, which renders the several patented inventions for the consumption of smoke (all are modifications of the same principle) inapplicable to them? or has any one—and which—of these patents been successfully applied to any known ironwork?

One more query. Are the ovens of a brick-kiln within the saving help of such appliances?

A. B. C.

A COLLEGE FOR ARCHITECTURAL DIPLOMAS.

Many years since Mr. Bartholomew strove earnestly in the *Builder* to awaken the profession, to arouse the Institute, and to arrange means whereby diplomas might be not only granted—as by a chartered body—but that without the possession of which it would be *criminal* for any one to pursue the practice or calling of architect. The view taken of the subject by Mr. B. was, I think, a rational one, though his machinery might have been too complicated, and the restrictions too severe. Without a college in which a certain course of education is pursued, but little can be effected. Of what value would be the medical diploma were there no distinct branches of study, at the colleges of Dublin, London, Edinburgh, &c. whereby a thorough training could be effected before the student entered the surgery or walked the hospitals? How could he be prepared for the struggles of after life, if left solely to the information and tutelage to be derived from the majority of the profession? He might leave with a mind stored perhaps with dogmas,—but without that vehicle, practice, by which alone that knowledge can be adapted to the various cases, and rendered of their full value.

Witness the hundreds who are yearly turned out as "finished," from various offices. Finished! indeed, is the period for which they were articled, but how seldom is the object of that instrument thoroughly effected.

Trained as most young men are—with the narrow and hard-to-be-applied educational course through which too many of them are literally *dragged*,—how can we look for that progress which ought reasonably to be expected from five years at the studio, or, if you will have it so,—the drawing-board? It too frequently happens that a pupil should have as intimate a knowledge of the principles of architecture when he enters an office, as he sometimes possesses when he leaves. And herein, I presume, is the real difficulty we have to surmount. Not that good outsiders should be kept out of the profession, but that those who have entered through the door should be rendered fit for the responsible positions

which most of them are intended to fill. It is the want of this which has sunk architecture to its present level in the estimation of the world. It has also given to those without any other means of existence an opportunity to christen themselves "architects," and to take their stand as such, for with the majority of the public this base metal too frequently passes as the current coin.

By such a provision alone can we elevate our profession. When we find in large letters upon huge spaces of brickwalls, as well as upon captivating door and window plates, "Architect and Builder, Surveyor, and General Agent, Auctioneer and Appraiser. N.B. Rents collected," surely it is high time for us to act. Let us do this, and speedily. Let us memorialise her most gracious Majesty for a charter to enable us to found a college, duly furnished with the necessary professors' chairs, and recognised professors to fill them, with all the other et ceteras that in the working out of the detail will be found necessary; and that accomplished, set about the issue of diplomas, and obtaining the sanction of Parliament to the same, so that none can risk the lives or money of the public without possessing the knowledge whereby alone that diploma can be obtained.

We should then have our pupils thoroughly prepared for office duties, a vast amount of labour (and unnecessary labour) saved the principal, and five years of actual practice as well as study, would then accomplish more than is now sometimes effected during the whole of a long and comparatively useless life. Vast benefit would also be conferred upon him to whose care the pupil would be entrusted.

Earnestly recommending the question to the consideration of the Institute, I will for the present conclude. In the meantime, let Mr. Chamberlain test the Architectural Association, and the professors at large, to whose expression of feeling upon this point, if made, I feel convinced the council of the Institute will give force. Let him, therefore, seek for that expression: a memorial to the Institute to act in this matter would, I am sure, receive the warmest support from nineteen-twentieths of the practising architects in town and country.

W. Wigginton.

SUPPLY OF QUANTITIES BY ARCHITECTS.

In reply to your correspondent's query on this head, I beg to observe that I invariably have the quantities taken out, and insert a charge of 1 per cent. to be paid by the builder, as a matter of course.

I hold that your correspondent was only following the usual course, and if the proprietors did not wish the quantities to be taken out, they should have informed him at the time of making the other arrangements.

As the quantities are paid for by the builder, it cannot be held that the cost of taking them out is included in the sum agreed to be paid for the plans and specifications by the proprietors. J. P. P.

*** Other communications on this subject are unavoidably postponed.

THE OPENING OF THE NEW MUSEUM (PICTURE GALLERY) DRESDEN.

After a protracted labour of several years, and the raised expectation of the whole of Europe, the above new temple of art was opened to the public on the 25th of September. No special opening ceremony took place, being incongruous to such grand sights. What had been predicted before, that no one would recognise the gallery, really was the case,—and an unguessed treasure of art bursts on our eyes. Old paintings, which we were obliged formerly to view with strained eyes, are now to be seen in a clear, wide light of day. The greatest improvement has accrued to the Italian school, which is now exhibited in the broad light of the upper room. The Dutch pictures, however, which are placed in the northerly room, with an exterior and wide light, have not improved much in their position. The finest pictures are exhibited in the middle saloons, which conclude towards the west with an especial piece, containing the Madonna del Siste di Raffaelle. This jewel of pictorial art has been now freed of its plate-glass covering, which lay like a damper between the canvas and the eye. Holbein's Maria, also, the German sample of the Italian Madonna, is exhibited on a separate scaffolding. The whole impression of the first visit to the new Dresden gallery is one of quiet grandeur, and by-and-by one gets accustomed to the expanse and comfort of the new spaces. The gallery will be open every day, except the Saturday; twice in the week at a fee of four groschen (about 4½d.); the other days gratis. It is to be borne in mind that the transfer of these numerous and costly pictures to this new museum was accomplished within the short space of three months.—*From German sources.*

SHORTENING SPOFFORTH CHURCH.

"An Old Member of the Yorkshire Architectural Society" writes us on this subject. He says:—

Your correspondent, "M. R. F." should rather have said "reducing the chancel," as the church at Spofforth is not altered beyond the removal of its modernisations. It is of the twelfth century. Its pillars and arcades remain as constructed, and, where defective, have been restored to the original form. The walls of the church have been rebuilt in harmony with them, and the south-west portal, plain, yet in keeping with many of the early churches of west Yorkshire.

The beautiful chancel of the fifteenth century was unsafe and required renovation, but the cost would preclude it. Doubtless it was built by the Percys, who had a castle near; and in those Catholic days might have been a prelude to a larger church, as it was out of all proportion to the earlier nave.

The chancel is built upon the foundations (recently discovered) of the earlier one, and harmonizes with the body. The tower is good of its kind, but late and overbanded.

Another point to be considered is the sound, which was defective in the larger one; but in the Roman Catholic service this would have mattered little, while in our own it is of the greatest importance.

I am an advocate for perfect restoration of our venerable and beautiful ecclesiastical buildings, yet I must consider their original form and intentions, and also our modern requirements, and not advocate a headlong restitution of alterations and adjuncts, in each variety of style, as though the building were intended for a museum rather than a sacred purpose.

Could ample funds be at all times commanded, believe me, I would have all our churches worked out in the beautiful varieties of the fourteenth century, but, where limited in means, act according to circumstances.

To prevent future cavilling about this church, it would be desirable to remove the indications of the late chancel, which remain eastward of the restoration. In all such cases may we work harmoniously.

LITHOGRAPHS BY PHOTOGRAPHY.

At the recent meeting of the British Association, in the section of Chemical Science, Professor Ramsey described a process by which Mr. Robert M'Pherson, of Rome, had succeeded in obtaining beautiful photo-lithographs—specimens of which had been hung up in the Photographic Exhibition in Buchanan-street. The steps of the process are as follow:—1. Bitumen is dissolved in sulphuric acid, and the solution is poured on an ordinary lithographic stone. The ether quickly evaporates, and leaves a thin coating of bitumen spread uniformly over the stone. This coating is sensitive to light, a discovery made originally by Mr. Niepce, of Chalons. 2. A negative on glass, or waxed paper, is applied to the sensitive coating of bitumen, and exposed to the full rays of the sun for a period longer or shorter according to the intensity of the light, and a faint impression on the bitumen is thus obtained. 3. The stone is now placed in a bath of sulphuric ether, which almost instantaneously dissolves the bitumen which has not been acted upon by light, leaving a delicate picture on the stone, composed of bitumen on which the light has fallen. 4. The stone, after being carefully washed, may be at once placed in the hands of the lithographer, who is to treat it in the ordinary manner with gum and acid, after which proofs may be thrown off by the usual process. Professor Ramsey then proceeded to state that the above process, modified, had been employed with success to etch plates of steel or copper, without the use of the burin:—1. The metal plate is prepared with a coating of bitumen, precisely in the manner noticed above. 2. A positive picture on glass or paper is then applied to the bitumen, and an impression is obtained by exposure to light. 3. The plate is placed in a bath of ether, and the bitumen not acted upon by light is dissolved out. A beautiful negative remains on the plate. 4. The plate is now to be plunged into a galvano-plastic bath, and gilded. The gold adheres to the bare metal that refuses to attach itself to the bitumen. 5. The bitumen is now removed entirely by the action of spirits and gentle heat. The lines of the negative picture are now represented in bare steel or copper, the rest of the plate being covered by a coating of gold. 6. Nitric acid is now applied as in the common etching process. The acid attacks the lines of the picture formed by the bare metal, but will not bite into the gilded surface. A perfect etching is thus obtained.

Miscellanea.

The New Pier at Margate.—Sir: I, for one, as an old inhabitant of Margate, am much obliged by your frank expression as to the appearance of our new pier. You have uttered the opinion, to my certain knowledge, of scores of the inhabitants to whom the pier is a perfect eyesore, and who grieve over their old jetty for the sake of its associations. It is really too bad that in a structure on which so much money has been spent as on this, there should not be one morsel of art, or striving for art, exhibited. A few horizontal beams carried on some groups of iron pipes constitute the pier. It is quite time some one spoke out: this is not the only engineering work which, on the ground mentioned, will make us the scoff of the next generation.—D.

Kilkenny Archæological Society.—The September meeting of the Kilkenny and South-east of Ireland Archæological Society was held at Kilkenny on Wednesday week, the Rev. J. Mease in the chair, when thirteen new members were elected, besides the Dublin Mechanics' Institute, which appears among the list of new members. The secretary read a letter from Mr. S. C. Hall, who had just been elected a member, and also from Mr. Rhind, under like circumstances. Various presentations were made to the library and museum of the society. Mr. W. Hackett, of Middleton, then communicated some observations on Stone Circles in India and in Ireland. Mr. Prim read a paper, giving an interesting account of the discovery of some Ogham stones and other antiquities in the raths of Dunbel, county of Kilkenny, since his previous report of 1852. Two Ogham stones, found in course of excavation, were broken into numerous pieces by the workmen employed, but the pieces were carefully collected, and the Oghams restored, as far as possible. One of them was 5½ feet long and 2 feet wide, tapering to 11½ inches. The other was 6 feet 3½ inches in length and 1 foot 1 inch wide, narrowing to 11 inches where there is a step within 8½ inches of the top, at which point the width decreases to 7½ inches, and again enlarges at the top to 9 inches. The inscriptions were pretty fully restored. The stones were of red or purple sandstone, only obtainable about seven miles distant, at Thomas-town, whence others, previously found in different parts of the same district, appear to have also been got, a circumstance which led Mr. Prim to the conclusion that such stones were carved by some tradesman located at the spot where the sandstone on which the carvings were cut was to be had. Blue limestone is the stone peculiar to the locality where the two described were discovered. Communications were laid before the meeting from the Rev. Samuel Hayman, on the Ecclesiastical Antiquities of Youghal; the Rev. Constantine Cosgrave, on the Hill of Keash; and the Rev. G. H. Reade, on the Round Tower of Inniskeen. Mr. James F. Ferguson, local secretary for Dublin, communicated the first portion of a translation of an Ancient Norman-French Poem descriptive of the Anglo-Norman conquest of Ireland, which has been epitomised by Harris, and published from the original in the British Museum. The committee intend to commence the publication of this interesting contribution to Irish history with the new year.

The Crimean Navvies.—A private letter says: "The immense loads carried by the Turks employed in the transport service perfectly astounded the English navvies. It is no uncommon thing for the Turkish labourer to convey 3 cwt. on a knot on his head three or four miles, and this too with perfect ease."

Increase of Steam Power.—It is said to have been ascertained, by a series of experiments at New York, that opaque steam—that is, steam when it becomes visible by being exposed to the influence of an atmosphere cooler than itself—acquires an increased in place of a diminished power of expansion, which is accounted for by supposing that the expansion of the air on being heated by the steam is greater than the loss of expansion in the steam itself from its being cooled. An engine has been constructed by Mr. Storms with a double acting air-pump, which is enveloped in water to keep the air cool. The water is admitted into the steam-chest just above the valve, where it is admitted immediately after the stroke of the piston has commenced. An engine so constructed, it is said, was found with equal resistance to give per pound of coal used 107 revolutions when steam alone was employed, and 190 when air was combined with the steam, so as to produce the cloud vapour.

The Iron Trade.—The usual meeting preliminary to the quarterly meetings of the Staffordshire and Worcestershire ironmasters was held on 28th ult. when strong endeavours were made to induce a rise of 40s. a ton, which, as designed, led to a sort of compromise, by an agreement of the less speculative amongst the masters to recognise a nominal rise of 20s. a ton. This by no means settles even the mere nominal price, for it may be remembered that a strange shuffle occurred at a recent quarterly dictum, when some were bent on taking the rise,—not from any specific sum previously declared by the combination, but from any alleged price which might have been forced up in the interval by others, or individually by some of the masters. Accordingly, while the new price is declared by the more moderate authorities to be 9*l.* for bars, the more reckless and gambling "parties" coolly quote the decision to be 10*l.* for bars, while pretending to blame the "small masters" as "undersellers" who desired to raise the price another pound, or to 11*l.* for bars!! What respect are "authorities" such as these entitled to by the really respectable portion of this extraordinary "trade?" An advance having thus meanwhile been declared, the puddlers and other workmen are already in for a share of the plunder, and perhaps nothing will tend so much to compel moderation and steady conduct as a thorn such as this in the sides of the trade combination.——The ironmasters of Cleveland and the surrounding district, we hear, have formed themselves into a combination also, and hold their meetings once a month at the Talbot Inn, Middlesbro', where they settle the price of iron and concert measures to promote the iron trade of the district.

Building and other Accidents.—A joiner, employed in the erection of the Blackburn Townhall, met with injuries on Friday in last week, which resulted in his death, a short time afterwards. He was working near the roof, and the plank upon which he was standing gave way, so that he was cast upon the floor of the next room, a descent of 12 yards.——Part of the Oakengates Tunnel, on the Shrewsbury and Birmingham line, fell in on Wednesday before last. It appears that close to the wall of the tunnel is an old pit shaft, which had never been filled up, except the upper portion; a platform having been constructed about 18 feet from the surface. Under this platform, the pit shaft was generally full of water, but this having been exhausted in some way, the platform gave way, and the water of the canal, which flows close by the spot, rushed in with such force as to burst in the wall of the tunnel. The breach made was about a yard square; and the line was inundated, as also were some of the houses in Oakengates.——The Bullo Pill Railway Station, on the South Wales Railway, about 12 miles from Gloucester, has been totally destroyed by fire.——A company is in progress of formation for carrying out the several inventions of Mr. G. H. Ingall, for preventing every class of railway accident it is possible to have control over. The association will be called the "Railway Accidents Prevention Company."——A balcony at Milan gave way on 17th ult. and twenty-five persons were precipitated from it into the street. Two of them died the same day, and the others were dangerously injured.

Experiments with Electric and other Lights.—Experiments took place on the upper part of the Common at Woolwich, in the presence of a select committee, on Monday in last week, when three different kinds of lights, for war and other purposes, were tested. The first was the electric light, which was exhibited by Mr. Inglis; the second the "Drummond Light," exhibited by Sergeant R. P. Jones, of the Royal Sappers and Miners; and the third the "Bude Light," of Mr. Gurney, who also entrusted it to the care of Sergeant Jones. The electric light is reported to have appeared to possess the power of penetrating farthest into darkness, and was the most brilliant; but the Drummond also possessed some advantages. It was more portable, and could be carried by two or three men, each taking a portion of the apparatus, whereas the electric light required a waggon drawn by two horses to convey it from place to place.

Fire-Bricks.—Mr. George Noble, of Pensher, has recently patented an invention, by which it is proposed to do away with manual labour in the manufacture of fire-bricks made from ground clay, by passing it directly from the grinding mill to the machine, where it is made into bricks ready for the kiln, instead of adding water and making it into a paste, according to the present process. This operation will save the expense of drying flats and coals, now used for preparing bricks for the burning kiln, and will prevent any alteration in form of the wet brick by handling. The invention consists of a combination of hydraulic machinery, for compressing clay in a pulverized state into bricks, and for changing the position of the moulds in which the clay is compressed, so that they may fill and discharge themselves after compression.

Screw Propellers.—An improved construction of this important accessory of modern steam navigation has been patented by Messrs. Kenworthy and Greenwood, of Leeds. This improved propeller is constructed in three pieces. By this arrangement the blade, in case of accident, can be refitted, being dovetailed upon the main shaft, upon which it can be set to any required angle; and, being entirely of wrought-iron, less liability of fracture exists. Captain Williams, of the City of Dublin Steam Packet Company's ship, *Windsor*, has also patented improvements in the propeller. This screw revolves in the water "end on," and the inventor claims this as an advantage, on the ground that it has more propelling surface than ordinary screws, combined with a less diameter.

Strike.—The shipwrights lately in the employ of Mr. Colchester, of Ipswich, have struck work, it seems, in consequence of a man being engaged who was not of their fraternity. The men readily obtained employment at other yards in the town, but all efforts then made to obtain hands from a distance to supply the vacancies in Mr. Colchester's yard were ineffectual.

Suffolk Institute of Archæology, &c.—A migratory meeting of this society was held on Friday before last. The members started from Bury St. Edmunds, making Woolpit church their first halting-place. Here they were met by the Rev. L. F. Page (the rector), and Mrs. Page, and a large number of ladies and gentlemen. After an examination of the church, the party assembled were told its history in a paper from Mr. Page. The next spot noted in the order of route was Haughley-park, in which stands a mansion, in the Tudor style, to the whole of which unlimited access was permitted by the Misses Crawford, and after a paper on the "History of Haughley," read by Mr. Tymms, the visitors were indebted to the hospitality of the ladies for luncheon. From thence the company proceeded to Haughley-castle, where they were met by Mr. C. Tyrrell, Sir H. J. Austin, and others. After ascending the lofty mound on which the castle formerly stood, its records were given in a paper from Mr. Tymms, and some lines in reference to the spot, written by the Rev. F. Aldrich, were read. The Rectory, where a variety of interesting objects had been arranged for inspection, was next visited, and then the church. At Stowmarket church, a paper describing its architectural features, with a sketch of its history, was read by Mr. Tymms, and the company then proceeded to inspect the vicarage—which the Rev. Mr. Hollingsworth had thrown open—not omitting a visit to "Milton's Mulberry Tree." Antiquities and curiosities were arranged at the County Court, and were examined prior to summons to dinner at the Assembly-room, where between thirty and forty ladies and gentlemen dined. The chair was occupied by the Rev. Lord Arthur Hervey, the president of the Institute.

City Baths and Washhouses. — Sir James Duke, M.P. is to present, at a Common Council, on Thursday next, the petition from the Guardians of the West London Union to the Corporation, praying for the establishment of Baths and Washhouses in the City.

Lectures on Church Building at Newcastle. —The first of a series of original papers intended to be delivered to the members of the Newcastle Church of England Institute during the winter session, was read by Mr. S. Oswald, architect, on Monday before last, the subject being the rise and progress of church building in England, from the introduction of Christianity, during the Roman occupation, until the Reformation, with notices of the subsequent period. The distinctive peculiarities of the various styles were pointed out in a familiar manner, and illustrated by numerous drawings and references to the churches of Newcastle and the neighbourhood.

"Leaden Pipes in the Supply of Water and Beer."—Having noticed your important article in last Saturday's *Builder*, relative to "leaden pipes in the supply of water and beer," we think it proper to call your attention to the fact, that a patent was taken out on the 19th April, 1853, by Mr. John Chatterton, a talented engineer of Birmingham, for coating gutta-percha tubing with lead. This combination of gutta-percha and lead secures remarkable strength, and at the same time avoids the danger arising from the use of the ordinary leaden pipes. We have much pleasure in handing you a specimen of tubing (made under Mr. Chatterton's patent), which has been subjected to the extraordinary pressure of 600 lbs. on the square inch, without exhibiting any symptoms of giving way.

The Gutta-Percha Co.

*** The specimen referred to appears to be well adapted to the purpose in view. The gutta-percha tube enclosed in the leaden one, though not attached to its interior, is perfectly protected by it, and the inner tube is of considerable thickness.

Metropolitan Gas-fitters' Association.—On Monday, a dinner was held at the George and Blue Boar, Holborn, as a means for getting together the gas fitters of the metropolis and suburbs, for the purpose of revivifying this association, which has been in abeyance for some year or two past. The value of such an association, under the energetic presidency of Dr. Bachhoffner, for disseminating the knowledge of the almost daily progress making in their calling, for obtaining lectures, to be delivered by the best authorities, and for the formation of a library of works more especially referring to the manufacture of gas and its application to domestic uses, must be too clear to the trade to require to be pointed out to them, so that we may now hope to see the matter established on a firm basis.

The Wiltshire Archæological Society.—The members of this society have just had their annual gathering. Among those who attended, were the Marquis of Lansdowne (patron of the society); Messrs. Sotheron, Heneage, Gladstone, Neeld, and Scrope, M.P.'s.; Mr. Britton, &c. The Rev. J. Wilkinson, of Broughton-Gifford, read a paper on "Parochial Histories." He suggested that committees of parish historians should be formed in towns, who should divide the work between them; and generally in every parish the clergyman should call in what coadjutors he pleased. All reports of several parishes would be in answer to certain heads of inquiry, and the whole would have to be revised and consolidated by competent editors. To this scheme of parochial history by the parochial clergy, the Bishop of Salisbury had given his warm approval. The whole of Scotland has already been treated in a similar manner, the work occupying from 1831 to 1854, and comprising fifteen imperial octavo volumes. On the last day the members were entertained by the Marquis of Lansdowne, at his lordship's seat at Bowood.

Indigenous Art in South America. — Rio de Janiero. — M. F. Pettrich, a German sculptor, possesses the largest sculpture *ateliers* in the Brazilian metropolis, and is engaged in a great many works for public buildings, and for the rich Brazilians. Amongst the former is a cycle of six figures, life-size, amongst which are the Indian Chief Te-cum-seh dying, and another, Tat-ruh-reh, leaning on a spear. To this belongs a row of basso-relievo, 5 or 6 feet high, representing the history of the North American Indians,—first their primordial state in the forest and the prairie, until their chiefs held council with four State ministers of the United States. M. Pettrich is also engaged in the models of two equestrian statues of the late Emperor Don Pedro I. the one representing him as a young man, the other as he proclaimed the Brazilian constitution on the *Plaza* of Rio de Janeiro.

TENDERS

For enlargement of Anderton's Hotel, Fleet-street Mr. J. H. Stevens, architect. Quantities supplied by Mr. Elliott:—

Little and Sons	£3,450	0	0
Mansfield and Sons	3,387	0	0
W. Sivil	3,270	0	0
Pritchard and Son	3,048	0	0
Ashby and Sons	2,949	0	0
Lawrence and Sons	2,948	0	0
T. Hawker	2,874	0	0
J. Rudkin	2,871	0	0
Brass and Son (accepted)	2,717	0	0

For erecting a pair of semi-detached villas, at Sydenham, for Messrs. Ralph. Quantities furnished by Mr. Roberts:—

Lawrence and Sons	£2,028	0	0
Gammon	1,949	0	0
Patrick and Son	1,878	0	0
Parry and Son	1,784	0	0
Macey	1,770	0	0
Maskill	1,134	0	0

For the erection of schools and teacher's residence for the parish of St. Matthias, Bristol. Mr. Norton, architect:—

Beaven and Son	£1,234	10	0
William Marquiss	1,200	0	0
John King	1,195	0	0
Jas. and Jos. Foster	1,144	0	0
Thomas Brooks (accepted)	1,086	0	0

For the erection of three houses with shops, at St. John's-wood. Mr. William C. Reed, architect:—

H. and R. Holland	£1,996	0	0
R. Ashby and Sons	1,912	0	0
John Salmon	1,695	3	0
R. Thomas	1,600	0	0

The Jewish Hospital, Mile End-road.—We are informed that none of the tenders for this hospital were accepted on 27th ult. there being an explicit understanding with the competitors to that effect.

TO CORRESPONDENTS.

"W. S."—"H. C."—"J. G. S. Jun."—"G. T."—"W. R."—"G. W."—"F." (brother.)—"J. E. G."—"A. B."—"X. T. L."—"W. G."—"J. D."—"S. H."—"H.W."—"W.W."—"M. R.I.B.A."—"G. A. C."—"L. C."—"W. L. S."—"A Sub."—"O. G. P."—"T. E."—"R. D."—"W. and Sons."—"J. S."

"*Books and Addresses.*"—We are forced to decline pointing out books or finding addresses.